



# Air & Energy Audit

## Chicago Conservation Corps (C3) Student Clubs

City of Chicago Department of Environment (DOE)



**By participating in this Air & Energy Audit, Club members will:**

1. Use a Kill-a-Watt to measure energy use of different appliances in the school.
2. Assess the energy use practices in the school.
3. Assess the quality of indoor air in the school.

### Overview

**In Part A: “How to Kill-A-Watt”**, Club members will do a quantitative analysis to find out how much electricity is used by plug-in appliances with a “Kill-A-Watt” Electricity Usage Monitor.

**In Part B: “Air & Energy Sleuth,”** groups of Club members will be assigned to inspect different areas of the school, making observations regarding factors that relate to energy use and air quality. Your observations will be used to give your school an overall score in the *air quality* category and *energy* category.

The data collected during this audit will help your Club identify potential ways the school could conserve energy and improve indoor air quality. The audit consists of three parts:

1. Plan for the Audit
2. Conduct the Audit
3. Analysis

### Materials

*To be provided by DOE at the Air & Energy Workshop:*

- Kill-A-Watt Electricity Usage Monitor
- Thermometers

*To be provided by the Club:*

- Calculator(s)
- Tissues
- Clipboards
- Pens/pencils

*The online report for this audit is due:*

**Friday, February 13<sup>th</sup>**

**To submit your report, log-in at**  
[www.chicagoconservationcorps.org](http://www.chicagoconservationcorps.org)  
**(click on “C3 Teachers”)**

*Note: Teacher stipend check is contingent on the timely completion of this report.*

If you have questions or concerns, contact:

Jeff Walter  
Chicago Department of  
Environment  
312-743-9283  
[conservation@cityofchicago.org](mailto:conservation@cityofchicago.org)

### Air & Energy in CPS Schools

Schools use a lot of *energy*! In the 2008 financial year, the Chicago Public School district allocated \$84 million, or about 2% of its total budget, for energy costs. However, according to the US Department of Energy, about 25% of the energy used in a typical school is wasted because of energy inefficiency. That is a lot of wasted energy, and aside from the fact that a lot of money is lost, the use of that energy is connected to the emission of greenhouse gases into the atmosphere, which can negatively impact our air quality and atmospheric balance.

*Indoor air quality* is another challenge that schools face. Sources of indoor pollutants in schools include polluted outdoor air, mold, pesticides, and emissions of volatile organic compounds (VOCs) from carpeting, furnishings and cleaning solutions. Indoor air quality problems can negatively affect student productivity and health, and even contribute to problems such as asthma.

What can your school do to improve its energy use practices and air quality?



### Plan for and Conduct the Audit (2 meetings)

1. **Review** this audit guide and contact DOE with any questions.
2. Discuss the topics of **energy use and air quality** and why they matter.
  - Use the game on this page, and/or the PowerPoint presentation from the Air & Energy Workshop (available on your Resource CD).
  - Emphasize their relation to global climate change.
    - Be sure to emphasize the major source of Illinois's power, and the impact that generating electricity from coal has on our global climate.
  - Have students investigate some of the **Additional Resources** (p.4).
3. Discuss the **goals of the audit**.
  - To inventory how energy is used around the school in order to determine how energy could be conserved.
  - To learn how air quality is affected by current practices in the school and how it could be improved.
  - To learn about current energy savings and air quality improvements that are already in place in the school.
4. Decide **how many rooms** of the school your Club will audit for your "Air & Energy Sleuth" observations.
  - Depending on the size of your school, consider limiting the audit to one wing or floor of the school, or to representative areas such as a few classrooms, the kitchen, the school office, and a hallway.
5. **Notify appropriate administration**, maintenance staff and other teachers that students will be visiting areas of the school to conduct their air and energy audit.
  - Find out if there are areas where energy is used that are off limits to students, and the extent to which students will need to be supervised as they move around the school campus.
    - Feel free to use DOE's sample memo to explain the project (included on your resource CD).
  - **Ask the building engineer** if s/he wants to be involved in some way. Options for involvement may include:
    - Tours of the places where energy is used and measured in the building, such as the boiler room and the energy meter.
    - Attendance at a Club meeting to explain the school's heat and air conditioning and necessary maintenance.
    - Provision of the school's energy use reports and statements to help students better understand energy use at the school.

### "Guess Which Gas...?"

By participating in this interactive game, Club members will be able to explain the definition of a greenhouse gas, give several examples of greenhouse gases, and name several different features and origins of various atmospheric gases.

#### Activity summary:

Each student gets a card with a different gas or component of air assigned to them. The card will not only have the written name of the gas but also its chemical formula, atomic structure, and two numbers. The first number is the molecule's concentration in our atmosphere, measured in parts per trillion. The second is the molecule's global warming potential (GWP). GWP looks at the capacity of the gas to absorb light and heat energy from the sun, thus trapping it in the atmosphere and contributing to the greenhouse effect. It is measured in relation to carbon dioxide. For example, methane has a GWP of 25. This means that if you measured the infrared absorption of a certain mass of methane, you would find that it absorbs 25 times more heat than the same mass of carbon dioxide.

Atmospheric concentration and GWP are important numbers because greenhouse gases of concern with regards to global climate change are either rapidly increasing in concentration, or have a very high global warming potential.

In this activity, descriptive statements will be read and students will move to one end of the room or the other based on if they think the statement applies to their molecule or not. The 'A' statement is read first, and students move accordingly.

*Continued on p. 3*



## “Guess Which Gas...?” *continued*

Next, the ‘B’ statement is read, and students move again according to the information they now have from the ‘B’ statement about their molecule. They then check off the correct answer on the checklist found on the back of their card. After each pair of statements, Club moderators should lead a discussion of what students learned.

### Directions:

1. Print/copy and cut apart air molecule cards, ensuring that you have one for each student. Be sure to print the sheets double sided so that each card has a molecule picture on one side, and a checklist on the back. For larger groups, multiple students can be assigned to the same molecule. Cards are in the appendix of this guide on p.15-20 and on the Air & Energy Resource CD.
2. Hand out air molecule cards to student participants (one to each student).
3. Read each yes/no statement (the ‘A’ statements) and the “Further Explanation” statements.
4. Students should move to one end of the room if they think the descriptive statement **does** apply to their component of air or the other end of the room if they think the description statement **does not** apply to their component of air.
5. After the students move, read the follow up explanation statement (‘B’) and have students move again to the correct end of the room. \*Do not focus on the fact that students might make the wrong move, but that we are all learning and participating in a demonstration about the air in our atmosphere.
6. Discuss misconceptions, surprises, reactions, etc.

### Statements:

1A You are a greenhouse gas.

*Further explanation: Greenhouse gases absorb heat which then warms our atmosphere. Without them, Earth would be too cold to be inhabited. If their concentration is too great, however, Earth could become too warm to be inhabited.*

1B Everything except N<sub>2</sub> and O<sub>2</sub>.

2A You make up more than 15% of the atmosphere.

2B Nitrogen is the most prevalent gas in our atmosphere. Its portion of the atmosphere is nearly 80%. Oxygen is approximately 19%. All of the other gas molecules make up less than 1%.

3A You are a naturally-occurring gas.

*Further explanation: Even if people weren't on the planet, these gases would still be found in the atmosphere.*

3B Water, carbon dioxide, methane, nitrogen, nitrous oxide, oxygen, and ozone are naturally occurring gases.

4A You are a naturally-occurring, human-**influenced** gas.

*Further explanation: These greenhouse gases occur naturally, but due to human influence exist in much higher concentrations in the atmosphere than they would otherwise.*

4B Carbon dioxide and methane. Carbon dioxide is emitted by coal-fired power plants and industry. Methane is produced due to flatulence and decay; humans raise livestock in massive feed lots and fill landfills, both of which increase methane in the atmosphere.

5A You are a human-**made** gas.

*Further explanation: These gases do not occur naturally, and are produced through industrial waste.*

5B Chlorofluorocarbons (CFC's), hydrofluorocarbons (HFC's) & sulfur hexafluoride (SF<sub>6</sub>) are human-made gases.

*Continued on p. 4*



## “Guess Which Gas...?” *continued*

6A You are increasing in concentration.

*Further explanation: As time goes on, more and more of this gas is in the atmosphere.*

6B Carbon dioxide, methane, hydrofluorocarbons (HFC's) and sulfur hexafluoride (SF<sub>6</sub>) are increasing in concentration. Carbon dioxide and methane are increasing due to human production in industrialized nations through transportation, industry, and livestock. The HFC's and SF<sub>6</sub> are increasing because they are substitutes for chlorofluorocarbons which were banned internationally within the past several decades because of their detrimental effect on the ozone layer.

7A You are a by-product of traditional energy production (coal-fired power).

*Further explanation: When you burn coal, this gas is emitted.*

7B Carbon dioxide and nitrous oxide. 40% of all U.S. carbon dioxide emissions and 18% of all U.S. nitrous oxide emissions come from coal-fired power plants.

8A Once emitted into the atmosphere, you will remain there for more than 50 years.

*Further explanation: This is often referred to as atmospheric lifetime; it is the length of time it takes a gas to either leave the atmosphere or break down.*

8B Carbon dioxide, nitrous oxide, sulfur hydrofluorocarbons, nitrogen, and oxygen.

Atmospheric lifetimes are listed below:

water vapor – 9 days

carbon dioxide – >10,000 years

methane – 12 years

nitrous oxide – 114 years

ozone – hours/days

chlorofluorocarbons – 45 years

hydrofluorocarbons – 9-18 years

sulfur hexafluoride – 3,200 years

nitrogen – >1 billion years

oxygen – 4 million years

9A You can be used as an energy source.

*Further explanation: People can produce electricity from this gas.*

9B Methane can be captured and burned to be used as an alternative energy source. For example, “cogeneration” is the production of electricity and heat through combustion of substances like methane. SC Johnson's Waxdale manufacturing plant in Racine, WI, uses the combustion of methane gas from a landfill a few miles away to generate the daily base load of electricity for his plant, plus between half and all of the steam needed for operations, depending on the season.

Source: <http://www.scjohnson.com/environment/conserving.asp> (click “Using Greener Energy”)

10A You are a “bad” gas.

10B This is a tricky question that doesn't really have a right answer! Nitrogen and oxygen are could definitely be considered “good” gases – they are not harmful. Chlorofluorocarbons could definitely be considered “bad” – they deplete the ozone and have been banned internationally. For most of the other greenhouse gases, however, the issue is not so straightforward. Without them, our planet would not be inhabitable. Gases like water vapor, carbon dioxide, ozone, nitrous oxide, and methane do contribute to climate change, but are necessary parts of our environment (e.g., are part of the water cycle, photosynthesis, etc.). HFCs and SF<sub>6</sub> have replaced more detrimental CFCs, and until alternatives are developed, are a better option. What do you think?

*Continued on p. 5*



## “Guess Which Gas...?” *con’t*

### Discussion Questions

1. What is a greenhouse gas? Why are they important?  
*Greenhouse gases absorb heat which then warms our atmosphere. Without them, Earth would be too cold to be inhabited. If their concentration is too great, however, Earth could become too warm to be inhabited.*
2. How do greenhouse gases relate to human-influenced climate change?  
*Because of human activities, some greenhouse gases are rapidly increasing in concentration, thus contributing to excessive warming. Humans have also created some new types of gases not found in nature that are contributing to global climate change.*
3. Are all greenhouse gases the same? What are some of their differences?  
*No. Some stay in the atmosphere longer than others. Some absorb more heat than others (look at global warming potential on cards). Some are found naturally, and some are not. Some are found in greater concentrations than others.*
4. How does this activity relate to energy conservation? To indoor air quality?
5. What did you find most surprising about what you learned today?

### Extension / Demonstration:

Students arrange themselves in order from the least concentrated to most concentrated air molecules according to the numbers on their cards. Students again arrange themselves in order from the least global warming potential to the highest global warming potential

### Part A: “How to Kill-A-Watt”

1. Hand out the **Activity Guide (p. 5)** and **Calculations Worksheet (p. 6)**.
  - Discuss the worksheet with all of the Club members, and select which appliances your Club will measure.
2. Go through Steps 1-6 on the worksheet together – plug the first appliance into the Kill-A-Watt.
  - Decide on a timeframe – for example, we recommend that you select several students to record observations after two days and switch to a new appliance. If you are measuring appliances outside of your own classroom, be sure to get permission from the other faculty and staff members who use the equipment.
3. Follow the plan your Club laid out to observe how much electricity is used by 3-4 different appliances. Club members should fill out columns **A** and **B** on the **Calculations Worksheet**.



### Part B: “Air & Energy Sleuth”

1. Hand out the **Air & Energy Sleuth Activity Guide (p. 7-8)** and the **Air & Energy Sleuth Observations Worksheet (p. 9-10)**, and explain the procedure.
  - Club members will divide into groups. Each group will be responsible for auditing specific areas within the school.
  - Club members will record their observations on the **Air & Energy Sleuth Observations Worksheet**.
2. Divide the Club into groups and assign a group to each audit area.
3. Have groups decide when they will audit their designated areas.
  - Club members should try to find times when they think they might catch problems such as lights and electronics left on inappropriately.
  - Immediately after school will probably be a good time in most cases.
  - Club members should make sure that the audit will not be disruptive.
4. During their chosen times, groups of Club members will audit their designated areas. Make sure that each group has enough copies of the **Air & Energy Sleuth Observations Worksheet**. They can audit four rooms/locations per double-sided worksheet.



## Analysis and Follow-Up – 1 meeting

### Part A: “How to Kill-A-Watt”

Don't forget to take photos!



1. Work together to complete the **Calculations Worksheet (p.6)**.
2. Use your results to discuss the big-picture implications of energy use.
  - Where does our electricity come from, and how does this impact climate change?
  - These measurements are for only a few appliances. Think about how huge these numbers would be if we calculated the energy used by every appliance in the school!

### Part B, “Air & Energy Sleuth”

1. Work together to complete the **Air & Energy Sleuth Score Worksheet (p.11)**.
2. Consider the following questions regarding air quality at your school.
  - How did your school's average Air Quality Score turn out? Is it high? Low? Average?
  - After observing conditions around the school, do you think that the score is pretty accurate?
  - What were the most common indoor air quality problems that you found? How could these problems be addressed? (see the “Making Change” project guide for ideas)
  - What is your school already doing to maintain a high level of air quality in the school?
3. Consider the following questions regarding energy use at your school. Is it high? Low? Average?
  - How did your school's average Energy Score turn out?
  - After observing conditions around the school, do you think that the score is pretty accurate?
  - What were the most common ways energy was wasted around the school? How could that waste be prevented? (see the “Making Change” project guide for ideas)
  - What are the most common ways that energy is already being conserved?
4. What is your long-term vision for your school based on what you've learned in the audit? *Hint: Consider how you might improve your school's Air Quality and/or Energy Scores. Look at your Observation Worksheets and your Club Totals Worksheet.*
5. Considering your long-term vision, what should your Club's goal be for improving energy conservation and indoor air quality during this unit?
6. As a Club, review the C3 Air & Energy Audit Report questions and formulate answers. Submit your online report on or before **Friday, February 13<sup>th</sup>** (hard copy attached for your reference).

#### More Information on Air and Energy Issues

**Pew Center on Global Climate Change:** <http://www.pewclimate.org/>

*An informative, reliable source on climate change.*

**EPA's Indoor Air Quality Tools for Schools:** <http://www.epa.gov/iaq/schools/>

*More information about what indoor air quality issues and solutions.*

**DOE's Residential Energy Assessment Program (REAP):** <http://webapps.cityofchicago.org/ERC/>

*Find out how to conduct an energy audit of your own home.*

**Energy Star School Page:** [http://www.energystar.gov/index.cfm?c=k12\\_schools.bus\\_schoolsk12](http://www.energystar.gov/index.cfm?c=k12_schools.bus_schoolsk12)

*(visit the Energy Star homepage → Buildings & Plants → “Getting Started For...” → select K-12)*

*Learn more about energy-saving technologies for schools.*

**US Department of Energy's Tips on Saving Energy & Money at Home:**

<http://www1.eere.energy.gov/consumer/tips/index.html>

**Clean Air Counts:** <http://www.cleanaircounts.org/households/index.php>

*A non-profit campaign that works to improve indoor and outdoor air quality in Chicago.*





## Part A: How to “Kill-a-Watt” Activity Guide

Chicago Conservation Corps (C3) Student Clubs  
City of Chicago Department of Environment (DOE)



Every day, we all use energy. But how much? During this activity, you’ll find out much electricity is used in your classroom by the things that you plug in. Electricity is measured in units called kilowatt-hours (kWh). Your “**Kill-A-Watt Electricity Usage Monitor**” will measure how many kilowatt-hours are being used when you plug something in.

Use the “**Kill-A-Watt**” to measure how much electricity is used by 3-5 different appliances. Choose appliances that are used on a frequent or ongoing basis, such as computers, monitors, and fax machines.

1. Choose an appliance with your teacher.
  - When choosing appliances, keep an eye out for the “Energy Star” symbol. This is like a “Gold Star” for energy efficiency. Buying new products that have the Energy Star symbol means you’ll save both energy and money.
2. Turn the appliance off completely, then unplug it.
3. Plug the “**Kill-A-Watt**” into a socket or extension cord where it is secure and will not jiggle. Then, plug the appliance into the “**Kill-A-Watt**.”
4. While the “**Kill-A-Watt**” is plugged in, take a look at the screen and try out some of its features.
  - Press the “Watt” button to see how many watts of electricity are being used.
5. Look at how much power it is using when the appliance is on, and then when it’s off.
  - Even when a plugged-in appliance is turned off, it still uses electricity. This is called the *phantom load*. (The “**Kill-A-Watt**” might not detect this because it is a very small amount). You can reduce your phantom load and conserve electricity by unplugging appliances when you’re not using them, or by plugging them into a power strip and switching the powerstrip off when the appliances are not in use.
6. Use the appliance as usual for at least 2 full school days.
7. After at least 2 full school days, turn the appliance completely off again, and take a look at the “**Kill-A-Watt**” screen.
8. Press the purple button to see how many kilowatt-hours of electricity were used by the appliance. Write this number down in **Column A** of the attached **Calculations Worksheet**.
9. Press the purple button again to display the amount of time that has passed since you plugged in the appliance. Write this in **Column B** of the **Calculations Worksheet** (round to the nearest half hour, and write in decimal form – example, write 2.5 hours instead of 2:30 hours).
10. Once you’ve recorded these two numbers, be sure the appliance is completely turned off, unplug the appliance and the “**Kill-A-Watt**,” and plug in the appliance to the wall again. Make sure you leave everything as you originally found it!
11. Measure at least two more appliances and record your observations.
12. Fill out the rest of the **Calculations Worksheet** with the help of your teacher. Explanations are on the worksheet.



### \*SPECIAL CHALLENGES\*

- When choosing appliances, try to find an Energy Star appliance and a comparable non-Energy Star appliance, and compare the difference. For example, compare two computer monitors, one with the Energy Star rating, and one without.
- Even though the Kill-a-Watt cannot easily measure one appliance’s phantom load, that doesn’t mean you *can’t* do it creatively! Try plugging a power strip into the Kill-a-Watt. Then plug several of the same appliance (e.g., lamps, projectors, etc.) into the power strip. Make sure ALL appliances are turned off and remain off (but plugged in) for a few days. See how much energy has been used by these inactive appliances in that period of time – that is a measure of phantom load.





## Part A: How to “Kill-a-Watt” Calculations Worksheet

**Chicago Conservation Corps (C3) Student Clubs**  
City of Chicago Department of Environment (DOE)



Appliance and Location	A. # of kWh used by appliance	B. # of hours appliance was plugged into Kill-A-Watt	C. Avg. # of kWh per hour used by appliance (A/B)	D. Avg. # of kWh per day used by appliance (Cx24)	E. # of kWh / schoolyear used by appliance (Dx180)	F. Cost of electricity cost per kWh	G. Cost per schoolyear to run appliance (ExF)	H. Pounds of carbon emitted per kWh in Illinois	I. Carbon emitted per schoolyear by appliance (ExH)**
<i>Example: Energy Star Computer Monitor, Classroom 126</i>	5.3	48	0.1104	2.65	477	<b>\$0.07</b>	\$33.39	<b>1.556</b>	742.212
1.						<b>\$0.07</b>		<b>1.556</b>	
2.						<b>\$0.07</b>		<b>1.556</b>	
3.						<b>\$0.07</b>		<b>1.556</b>	
4.						<b>\$0.07</b>		<b>1.556</b>	

\*\*The electricity used by the appliance was mostly made by burning coal. This emits carbon into the air, which is a cause of climate change.



In this activity, your Club will explore your school's indoor air quality and energy conservation practices. There are some easy ways to assess these issues just by looking for specific clues or details, like a detective. So, for this activity, consider yourself an **Air & Energy Sleuth!**



In order to help you find the right clues (and complete the Air & Energy Audit), use the **Part B: Air & Energy Sleuth Observation Worksheet**. There, you can find a list of ten questions you will answer for every location.

### **Indoor Air Quality**

Questions involving **dust, trash smells, and blocked vents** relate to the cleanliness of the air that you breathe in your school. If rooms aren't cleaned properly, or if fresh air can't enter the room, health problems like asthmas and allergies can be aggravated.

Questions involving **chemical odors and peeling or flaking paint** also relate to human health, but are more serious in some ways. For example, some chemical odors (like harsh cleansers or diesel fuels) have actually been linked to cancer! Peeling or flaking paint could be the result of water damage, which can lead to mold and mildew growth, both of which are allergens. More severely, if your building was built before 1980, the paint flakes could contain lead which, if ingested in large amounts, can lead to lead poisoning.

EPA studies indicate that indoor levels of air pollutants can be two to five times higher than outdoor levels. This is especially important as it relates to schools, since youth are particularly susceptible to air pollution. So, as Air & Energy Sleuths, these are important clues for you to look for!

### **Energy Efficiency**

The questions under the Energy column relate to ways in which your school could be conserving (or wasting!) energy. Some of these questions are straightforward; for example, leaving **appliances or lights on** when they are not in use is an obvious waste of electricity.

Some other questions, however, might be a little more confusing, but they all relate to energy use! For example, if there are **cracks in or around the windows**, it becomes difficult to control the temperature in the room. If it's cold outside (and you have the heat on), that heat can escape through cracks in the window, plus you will need to heat the cold air coming in – that's a waste of electricity! The same is true if it's hot outside and you have the air conditioning on – all of that cold air is escaping, wasting the energy that made it cold and requiring you to use more energy to cool the warm air coming in from outside. Experts say that if you want to save energy in your heating and cooling, you should have a well-insulated room and keep it at **68 degrees in the winter** (just warm enough for most people) or **72 degrees in the summer** (just cool enough for most people). You can use the provided thermometers to measure the temperature of the locations you visit.

Finally, there is a question about **phantom load**. Phantom load is the energy that is used (and wasted) when an appliance is not in use, but still plugged in. To prevent phantom load energy loss, you can unplug appliances when they are not in use, or plug appliances into a power strip that is turned off at the end of the day.

So, now that you understand the importance of your job, **turn the page** for specific instructions!

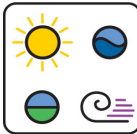
## Part B: Air & Energy Sleuth Activity Guide

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1. Decide which areas your school wants to audit. Split into groups so that you can visit all of the locations on your list over the course of one meeting or less.
2. Make sure that each group has enough copies of the Air & Energy Sleuth Observations Worksheet. Each double-sided sheet has space for you to audit up to four locations.
3. Make sure each group has a thermometer (to measure the temperature of the room) and a tissue (to hold in front of a vent to see if air is moving through it).
4. Write the names of the locations you are auditing under the column labeled “Location,” listing only one location per set of ten questions.
5. Start your audit! Visit each location, and answer each of the ten questions on the list by placing a check mark under the “Yes” or “No” column. If you make any additional observations, you can make those notes in the area provided for each classroom. Note: when measuring the temperature, set the thermometer on a desk or table for a minute or two before reading the data.
6. For each room, add up the Air Quality Score and the Energy Score. First, add up the number of boxes checked “No” under the Air Quality category and write that in the **bold** box for that location. Then, do the same thing under the Energy category.
  - If a box is checked “No,” that is a good thing! For example, for the first question, “Are the windowsills dusty?” if you checked “No,” then that location is kept nice and clean.
  - The highest score that a location can get in each category is a 5 – that means that your school is doing a great job keeping its air clean or conserving energy.
  - The lowest score that a location can get in each category is a 0 – that means that your school has some room for improvement.
7. After you have finished the audits of all of your areas, and determined each location’s Air Quality Score and Energy Score, count how many total locations you audited. You’ll need this number later.
8. Next, add up all of the Air Quality Scores determined by your group. In other words, add up all of the bold boxes under the Air Quality category on your worksheets.
9. Add up all of the Energy Scores on your worksheets separately.
10. After everyone has completed the audits of their areas and added up all of the information from the worksheets, work together to complete the **Score Worksheet**. This worksheet will help you determine an overall score for your entire school. Each group will tell a group recorder how many total locations they audited, the sum of the Air Quality Scores, and the sum of the Energy Scores (again, 0 means there is room for overall school improvement, while 5 means your school is doing a great job keeping its air clean or conserving energy). Do you notice any overall trends?





## Part B: Air & Energy Sleuth Observations Worksheet

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Location	AIR QUALITY			ENERGY			
	<i>Sleuth Question</i>	Yes	No	<i>Sleuth Question</i>	Yes	No	
	Are the <b>windowsills</b> dusty?	<input type="checkbox"/>	<input type="checkbox"/>	Are there cracks in or around the <b>windows</b> ?	<input type="checkbox"/>	<input type="checkbox"/>	
	Are the <b>vents</b> blocked, preventing air from flowing easily? (For example, are they obstructed by posters, shelves, etc.?)	<input type="checkbox"/>	<input type="checkbox"/>	Are there <b>lights</b> left on unnecessarily? (If the room is unoccupied, the lights should be off. Also, if the room is occupied but there's enough light coming through the windows, then the lights should be turned off.)	<input type="checkbox"/>	<input type="checkbox"/>	
	Is <b>paint</b> peeling or flaking off of the walls?	<input type="checkbox"/>	<input type="checkbox"/>	Is energy being wasted due to <b>phantom load</b> ?	<input type="checkbox"/>	<input type="checkbox"/>	
	Is the <b>trash</b> noticeably smelly from a few feet away?	<input type="checkbox"/>	<input type="checkbox"/>	Is the <b>temperature</b> above 68 degrees (if it is winter) or below 72 degrees (if it is summer)?	<input type="checkbox"/>	<input type="checkbox"/>	
	Are there <b>chemical</b> odors?	<input type="checkbox"/>	<input type="checkbox"/>	Are there any <b>appliances</b> that are not in use left on?	<input type="checkbox"/>	<input type="checkbox"/>	
Add up every "NO" for this room:				<input type="checkbox"/>	Add up every "NO" for this room:		
<b>Additional observations for this location:</b>							

Location	AIR QUALITY			ENERGY			
	<i>Sleuth Question</i>	Yes	No	<i>Sleuth Question</i>	Yes	No	
	Are the <b>windowsills</b> dusty?	<input type="checkbox"/>	<input type="checkbox"/>	Are there cracks in or around the <b>windows</b> ?	<input type="checkbox"/>	<input type="checkbox"/>	
	Are the <b>vents</b> blocked, preventing air from flowing easily? (For example, are they obstructed by posters, shelves, etc.?)	<input type="checkbox"/>	<input type="checkbox"/>	Are there <b>lights</b> left on unnecessarily? (If the room is unoccupied, the lights should be off. Also, if the room is occupied but there's enough light coming through the windows, then the lights should be turned off.)	<input type="checkbox"/>	<input type="checkbox"/>	
	Is <b>paint</b> peeling or flaking off of the walls?	<input type="checkbox"/>	<input type="checkbox"/>	Is energy being wasted due to <b>phantom load</b> ?	<input type="checkbox"/>	<input type="checkbox"/>	
	Is the <b>trash</b> noticeably smelly from a few feet away?	<input type="checkbox"/>	<input type="checkbox"/>	Is the <b>temperature</b> above 68 degrees (if it is winter) or below 72 degrees (if it is summer)?	<input type="checkbox"/>	<input type="checkbox"/>	
	Are there <b>chemical</b> odors?	<input type="checkbox"/>	<input type="checkbox"/>	Are there any <b>appliances</b> that are not in use left on?	<input type="checkbox"/>	<input type="checkbox"/>	
Add up every "NO" for this room:				<input type="checkbox"/>	Add up every "NO" for this room:		
<b>Additional observations for this location:</b>							
Total AIR QUALITY points for this page				<input type="checkbox"/>	Total ENERGY points for this page		



Location	AIR QUALITY			ENERGY		
	<i>Sleuth Question</i>	Yes	No	<i>Sleuth Question</i>	Yes	No
	Are the <b>windowsills</b> dusty?			Are there cracks in or around the <b>windows</b> ?		
	Are the <b>vents</b> blocked, preventing air from flowing easily? (For example, are they obstructed by posters, shelves, etc.?)			Are there <b>lights</b> left on unnecessarily? (If the room is unoccupied, the lights should be off. Also, if the room is occupied but there's enough light coming through the windows, then the lights should be turned off.)		
	Is <b>paint</b> peeling or flaking off of the walls?			Is energy being wasted due to <b>phantom load</b> ?		
	Is the <b>trash</b> noticeably smelly from a few feet away?			Is the <b>temperature</b> above 68 degrees (if it is winter) or below 72 degrees (if it is summer)?		
	Are there <b>chemical</b> odors?			Are there any <b>appliances</b> that are not in use left on?		
Add up every "NO" for this room:				Add up every "NO" for this room:		
<b>Additional observations for this location:</b>						

Location	AIR QUALITY			ENERGY		
	<i>Sleuth Question</i>	Yes	No	<i>Sleuth Question</i>	Yes	No
	Are the <b>windowsills</b> dusty?			Are there cracks in or around the <b>windows</b> ?		
	Are the <b>vents</b> blocked, preventing air from flowing easily? (For example, are they obstructed by posters, shelves, etc.?)			Are there <b>lights</b> left on unnecessarily? (If the room is unoccupied, the lights should be off. Also, if the room is occupied but there's enough light coming through the windows, then the lights should be turned off.)		
	Is <b>paint</b> peeling or flaking off of the walls?			Is energy being wasted due to <b>phantom load</b> ?		
	Is the <b>trash</b> noticeably smelly from a few feet away?			Is the <b>temperature</b> above 68 degrees (if it is winter) or below 72 degrees (if it is summer)?		
	Are there <b>chemical</b> odors?			Are there any <b>appliances</b> that are not in use left on?		
Add up every "NO" for this room:				Add up every "NO" for this room:		
<b>Additional observations for this location:</b>						
Total AIR QUALITY points for this page				Total ENERGY points for this page		





## Part B: Air & Energy Sleuth Score Worksheet

**Chicago Conservation Corps (C3) Student Clubs**  
City of Chicago Department of Environment (DOE)



To fill out this worksheet, have every group report their numbers to the rest of the Club. List each group's findings under the appropriate column, then find your totals. Remember that a "5" is a very high score and a "0" is a very low score.

### AIR QUALITY SCORE

<p style="text-align: center;"><b>How many locations did you audit?</b></p>	<p style="text-align: center;"><b>What is the total number of boxes checked "No" for all of your group's locations?</b> (In other words, count how many "Nos" are checked on your group's worksheets under the Air column.)</p>
<p><b>Total number of locations audited by Club:</b></p>	<div style="border: 2px solid black; width: 80px; height: 40px; margin: 0 auto;"></div>
<p>To calculate your school's <b>AIR QUALITY SCORE</b>, divide the black box on the right by the black box on the left (total number of boxes checked "No" divided by total number of locations).</p>	<div style="border: 2px solid black; width: 80px; height: 40px; margin: 0 auto;"></div>

### ENERGY SCORE

<p style="text-align: center;"><b>How many locations did you audit?</b></p>	<p style="text-align: center;"><b>What is the total number of boxes checked "No" for all of your group's locations?</b> (In other words, count how many "Nos" are checked on your group's worksheet under the Energy column.)</p>
<p><b>Total number of locations audited by Club:</b></p>	<div style="border: 2px solid black; width: 80px; height: 40px; margin: 0 auto;"></div>
<p>To calculate your school's <b>ENERGY SCORE</b>, divide the black box on the right by the black box on the left (total number of boxes checked "No" divided by total number of locations).</p>	<div style="border: 2px solid black; width: 80px; height: 40px; margin: 0 auto;"></div>

